

**CPC****COOPERATIVE PATENT CLASSIFICATION****F26B****DRYING SOLID MATERIALS OR OBJECTS BY REMOVING LIQUID THEREFROM**

(racks for drying fruit and vegetables [A01F 25/12](#); drying foodstuffs [A23](#); drying hair [A45D 20/00](#); body-drying implements [A47K 10/00](#); drying household articles [A47L](#), { e.g. drying footwear [A47L 23/20](#);} drying gases and vapours [B01D](#); chemical and physical processes for dewatering or like separating liquids from solids [B01D 43/00](#); centrifugal apparatus [B04](#); drying ceramics [C04B 33/30](#); drying yarns and fabrics in association with some other form of treatment [D06C](#); drying frames for laundry without heating or positive air circulation, domestic and like spin-dryers, wringing and hot pressing laundry [D06F](#); furnaces, kilns, ovens [F27](#); { treatment including a drying step of semiconductor substrates, e.g. wafers, [H01L 21/00S2D4](#)})

**WARNING**

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[F26B 11/06](#) covered by [F26B 11/0486](#)  
[F26B 13/02](#) covered by [F26B 13/10](#)  
[F26B 13/04](#) covered by [F26B 13/10](#)  
[F26B 13/20](#) covered by [F26B 13/104](#)  
[F26B 23/08](#) covered by [F26B 3/34B](#), [F26B 3/347](#)

**Processes for drying**

- F26B 1/00** Preliminary treatment of solid materials or objects to facilitate drying, {e.g. mixing or backmixing the materials to be dried with predominantly dry solids ([F26B 5/005](#) takes precedence)}
- F26B 1/005** . {by means of desintegrating, e.g. crushing, shredding, milling the materials to be dried ([F26B 17/102](#), [F26B 17/103](#) take precedence)}
- F26B 3/00** Drying solid materials or objects by processes involving the application of heat (in specific machines or apparatus [F26B 9/00](#) to [F26B 19/00](#))
- F26B 3/005** . {by applying a combustible liquid onto the materials, the liquid being burnt off subsequently}
- F26B 3/02** . by convection, i.e. heat being conveyed from a heat source to the materials or objects to be dried by a gas or vapour, e.g. air {([F26B 3/283](#) and [F26B 3/343](#) take precedence)}
- F26B 3/04** .. the gas or vapour circulating over or surrounding the materials or objects to be dried ([F26B 3/14](#) takes precedence)
- F26B 3/06** .. the gas or vapour flowing through the materials or objects to be dried ([F26B 3/14](#) takes precedence)
- F26B 3/08** ... so as to loosen them, e.g. to form a fluidised bed {"fluidised-bed" technique in general [B01J 8/24](#); centrifugal fluidised beds [F26B 7/007](#)}

- F26B 3/082 . . . . {arrangements of devices for distributing fluidising gas, e.g. grids, nozzles (F26B 3/0926 takes precedence; such devices per se B01J 8/44)}
- F26B 3/084 . . . . with heat exchange taking place in the fluidised bed, {e.g. combined direct and indirect heat exchange}
- F26B 3/088 . . . . using inert thermally-stabilised particles
- F26B 3/092 . . . . agitating the fluidised bed, e.g. by vibrating or pulsating
- F26B 3/0923 . . . . . {by mechanical means, e.g. vibrated plate, stirrer}
- F26B 3/0926 . . . . . {by pneumatic means, e.g. spouted beds}
- F26B 3/097 . . . . using a magnetic field to stabilise the fluidised bed
- F26B 3/10 . . the gas or vapour carrying the materials or objects to be dried with it
- F26B 3/12 . . . in the form of a spray, {i.e. sprayed or dispersed emulsions or suspensions (spray drying of solutions B01D 1/18)}
- F26B 3/14 . . the materials or objects to be dried being moved by gravity
- F26B 3/16 . . . in a counter-flow of the gas or vapour
- F26B 3/18 . by conduction, i.e. the heat is conveyed from the heat source, e.g. gas flame, to the materials or objects to be dried by direct contact
- F26B 3/20 . . the heat source being a heated surface {e.g. a moving belt or conveyer}(F26B 3/22 takes precedence)
- F26B 3/205 . . . {the materials to be dried covering or being mixed with heated inert particles which may be recycled}
- F26B 3/22 . . the heat source and the materials or objects to be dried being in relative motion, e.g. of vibration
- F26B 3/225 . . . {the materials or objects to be dried being immersed in a fluidised bed of heated particles (for webs F26B 13/106)}
- F26B 3/24 . . . the movement being rotation
- F26B 3/26 . . . the movement being performed by gravity
- F26B 3/28 . by radiation, e.g. from the sun
- F26B 3/283 . . {in combination with convection}
- F26B 3/286 . . . {by solar radiation}
- F26B 3/30 . . from infra-red-emitting elements {(by radiation emanating from passages containing heated fluids other than combustion gases F26B 23/10)}
- F26B 3/305 . . . {the infra-red radiation being generated by combustion or combustion gases}
- F26B 3/32 . by development of heat within the materials or objects to be dried, {e.g. by fermentation or other microbiological action}
- F26B 3/34 . . by using electrical effects
- F26B 3/343 . . . {in combination with convection}
- F26B 3/347 . . . Electromagnetic heating, e.g. induction heating or heating using microwave energy
- F26B 3/353 . . . Resistance heating, {e.g. using the materials or objects to be dried as an electrical resistance}
- F26B 3/36 . . by using mechanical effects, e.g. by friction (by using ultrasonic vibrations F26B 5/02)
- F26B 5/00** **Drying solid materials or objects by processes not involving the application of heat**

(separating liquids from solids by straining [B01D](#); replacing liquids in wet solids by other liquids, e.g. water by spirit, [B01D 12/00](#); drying by electrophoresis [B01J](#))

- F26B 5/005 . {by dipping them into or mixing them with a chemical liquid, e.g. organic; chemical, e.g. organic, dewatering aids ([F26B 3/005](#) takes precedence; using chemical vapours or gases [F26B 21/14](#))}
- F26B 5/02 . by using ultrasonic vibrations {(using sonic energy generated by pulse jet combustion [F26B 23/026](#))}
- F26B 5/04 . by evaporation or sublimation of moisture under reduced pressure, e.g. in a vacuum {([F26B 11/049](#) and [F26B 17/128](#) take precedence)}

#### **NOTE**

In subgroups [F26B 5/04](#) and [F26B 5/06](#), the term "not including the application of heat" is disregarded for classification purposes. When drying with the use of vacuum, frequently heat is applied to compensate for the cooling effect or to promote sublimation from the frozen state

- F26B 5/041 .. {for drying flowable materials, e.g. suspensions, bulk goods, in a continuous operation, e.g. with locks or other air tight arrangements for charging/discharging}
- F26B 5/042 .. {for drying articles or discrete batches of material in a continuous or semi-continuous operation, e.g. with locks or other air tight arrangements for charging/discharging}
- F26B 5/044 .. {for drying materials in a batch operation in an enclosure having a plurality of shelves which may be heated ([F26B 5/045](#) takes precedence)}
- F26B 5/045 .. {for drying thin, flat articles in a batch operation, e.g. leather, rugs, gels}
- F26B 5/047 .. {for continuous drying of material in long length, e.g. webs}
- F26B 5/048 .. {in combination with heat developed by electro-magnetic means, e.g. microwave energy}
- F26B 5/06 .. the process involving freezing
- F26B 5/065 ... {the product to be freeze-dried being sprayed, dispersed or pulverised}
- F26B 5/08 . by centrifugal treatment
- F26B 5/10 .. the process involving freezing
- F26B 5/12 . by suction
- F26B 5/14 . by applying pressure, e.g. wringing; by brushing; by wiping
- F26B 5/16 . by contact with sorbent bodies, e.g. absorbent mould; by admixture with sorbent materials
- F26B 7/00** **Drying solid materials or objects by processes using a combination of processes not covered by a single one of groups [F26B 3/00](#) and [F26B 5/00](#){([F26B 1/005](#), [F26B 5/04](#), [F26B 23/026](#) take precedence)}**
- F26B 7/002 . {using an electric field and heat}

F26B 7/005 . {using admixture with sorbent materials and heat, e.g. generated by the mixture}

F26B 7/007 . {centrifugal fluidised beds}

### Machines or apparatus for drying

**F26B 9/00** **Machines or apparatus for drying solid materials or objects at rest or with only local agitation; Domestic airing cupboards** {(domestic laundry drying cabinets or chambers having heating or ventilating means [D06F 58/10](#))}

F26B 9/003 . {Small self-contained devices, e.g. portable}

F26B 9/006 . {Removable covering devices, e.g. pliable or flexible}

F26B 9/02 . in buildings (special types of buildings [E04H](#))

F26B 9/04 . in presses or clamping devices

F26B 9/06 . in stationary drums or chambers

F26B 9/063 .. {for drying granular material in bulk e.g. grain bins or silos with false floor (shallow layer rotary sweep drying bins [F26B 9/10](#); perforated wall silos with drying air channels in the stack [F26B 9/103](#))}

F26B 9/066 .. {the products to be dried being disposed on one or more containers, which may have at least partly gas-permeable walls, e.g. trays or shelves in a stack ([F26B 9/003](#) takes precedence; in combination with duct systems [F26B 21/00](#))}

F26B 9/08 .. including agitating devices, {e.g. pneumatic recirculation arrangements (unloading devices [F26B 25/002](#); spouted beds [F26B 3/0926](#))}

F26B 9/082 ... {mechanically agitating or recirculating the material being dried}

F26B 9/085 .... {moving the material in a substantially vertical sense using conveyers or agitators, e.g. screws or augers with vertical axis, which are positioned inside the drying enclosure}

F26B 9/087 .... {the recirculation path being positioned outside the drying enclosure}

F26B 9/10 . in the open air; in pans or tables in rooms; Drying stacks of loose material {on floors which may be covered, e.g. by a roof (ventilating means of stacks for agricultural produce [A01F 25/08](#))}

F26B 9/103 .. {using fixed or removable drying air channels placed in the stack, e.g. horizontally or vertically}

F26B 9/106 ... {the channels to be inserted into the stack, e.g. after its formation}

**F26B 11/00** **Machines or apparatus for drying solid materials or objects with movement which is non-progressive**

F26B 11/02 . in moving drums or other mainly-closed receptacles ([F26B 11/18](#) takes precedence)

F26B 11/022 .. {Arrangements of drives, bearings, supports}

F26B 11/024 .. {Arrangements for gas-sealing the drum}

F26B 11/026 .. {Arrangements for charging or discharging the materials to be dried, e.g. discharging by reversing drum rotation, using spiral-type inserts}

- F26B 11/028 .. {Arrangements for the supply or exhaust of gaseous drying medium for direct heat transfer, e.g. perforated tubes, annular passages, burner arrangements, dust separation, combined direct and indirect heating}
- F26B 11/04 .. rotating about a horizontal or slightly-inclined axis {([F26B 11/022](#), [F26B 11/024](#), [F26B 11/026](#), [F26B 11/028](#) take precedence)}
- F26B 11/0404 ... {with internal subdivision of the drum, e.g. for subdividing or recycling the material to be dried (spiral-type or other inserts for discharging purposes [F26B 11/026](#))}
- F26B 11/0409 ..... {the subdivision consisting of a plurality of substantially radially oriented internal walls, e.g. forming multiple sector-shaped chambers}
- F26B 11/0413 ..... {the subdivision consisting of concentric walls, e.g. multi-pass or recirculation systems; the subdivision consisting of spiral-shaped walls (tubular or annular passages for supply or exhaust of drying gas [F26B 11/028](#))}
- F26B 11/0418 ..... {the subdivision consisting of a plurality of parallel tubes, e.g. through which the material to be dried is conveyed in single or multi-pass fashion (sector-shaped tubes [F26B 11/0409](#))}
- F26B 11/0422 ..... {the tubes having internal members}
- F26B 11/0427 ..... {Constructional details, e.g. arrangements of drives, supports, bearings, gas-sealing, heating medium supply or exhaust}
- F26B 11/0431 ..... {Arrangements for feeding or discharging materials to be dried}
- F26B 11/0436 ... {comprising multiple stages, e.g. multiple rotating drums subsequently receiving the material to be dried; Provisions for heat recuperation}
- F26B 11/044 ... {the drum or receptacle having a variable outer or inner diameter in axial direction, e.g. tronconical; the drum or receptacle having a polygonal or non-cylindrical shape ([F26B 11/0436](#), [F26B 11/049](#) take precedence)}
- F26B 11/0445 ... {having conductive heating arrangements, e.g. heated drum wall}
- F26B 11/045 ..... {using heated internal elements, e.g. which move through or convey the materials to be dried (loose bodies, e.g. balls [F26B 11/0472](#))}
- F26B 11/0454 ..... {the elements being discs}
- F26B 11/0459 ..... {the elements being chains}
- F26B 11/0463 ... {having internal elements, e.g. which are being moved or rotated by means other than the rotating drum wall ([F26B 11/0404](#), [F26B 11/0445](#) take precedence)}
- F26B 11/0468 ..... {for disintegrating, crushing, or for being mixed with the materials to be dried}
- F26B 11/0472 ..... {the elements being loose bodies or materials, e.g. balls, which may have a sorbent effect (chains fixed to the drum [F26B 11/0459](#))}
- F26B 11/0477 ..... {for mixing, stirring or conveying the materials to be dried, e.g. mounted to the wall, rotating with the drum}
- F26B 11/0481 ..... { the elements having a screw- or auger-like shape, or form screw- or auger-like channels}
- F26B 11/0486 ..... {the elements being held stationary, e.g. internal scraper blades}
- F26B 11/049 ... {with provisions for working under increased or reduced pressure, with or without heating}
- F26B 11/0495 ... {with provisions for drying by electro-magnetic means, e.g. radiation, microwaves (burner arrangements [F26B 11/028](#))}
- F26B 11/08 .. rotating about a vertical or steeply-inclined axis
- F26B 11/10 ... with stirring devices which are held stationary
- F26B 11/12 . in stationary drums or other mainly-closed receptacles with moving stirring devices

[F26B 11/22](#) takes precedence)

- F26B 11/14     ..     the stirring device moving in a horizontal or slightly-inclined plane
- F26B 11/16     ..     the stirring device moving in a vertical or steeply-inclined plane
  
- F26B 11/18     .     on or in moving dishes, trays, pans, or other mainly-open receptacles
- F26B 11/181    ..     {the receptacle being a foraminous, perforated or open-structured drum or drum-like container, e.g. rotating around a substantially horizontal or vertical axis; the receptacle being multiple perforated drums, e.g. in superimposed arrangement}
- F26B 11/182    ...     {Arrangements for the supply or exhaust of gaseous drying medium, e.g. perforated tubes ([F26B 11/185](#) takes precedence)}
- F26B 11/184    ...     { provided with internal means for mixing, stirring or conveying the materials to be dried ([F26B 11/182](#), [F26B 11/185](#) take precedence)}
- F26B 11/185    ...     {the drum provided with internal subdivisions or multiple walls}
- F26B 11/187    ....     {the subdivisions consisting of sector-shaped perforated chambers}
- F26B 11/188    ....     {the subdivisions consisting of concentric perforated walls, or spiral-shaped walls}
- F26B 11/20     ..     with stirring devices which are held stationary
  
- F26B 11/22     .     on or in stationary dishes, trays, pans, or other mainly-open receptacles, with moving stirring devices

## **F26B 13/00**

### **Machines and apparatus for drying fabrics, fibres, yarns, or other materials in long lengths, with progressive movement**

- F26B 13/001    .     {Drying and oxidising yarns, ribbons or the like}
- F26B 13/002    ..     {Drying coated, e.g. enamelled, varnished, wires}
- F26B 13/003    ..     {in the shape of spools, coils, bobbins or the like ([F26B 21/007](#) takes precedence; drying yarn hanks [F26B 15/124](#))}
  
- F26B 13/004    .     {Drying ribbons}
  
- F26B 13/005    .     {Seals, locks, e.g. gas barriers for web drying enclosures}
  
- F26B 13/006    .     {with movement in a spiral path}
  
- F26B 13/007    .     {Treating a particular portion of the web or plate, e.g. the edge}
  
- F26B 13/008    .     {Controlling the moisture profile accross the width of the material}
  
- F26B 13/06     .     with movement in a sinuous or zig-zag path
- F26B 13/08     ..     using rollers
  
- F26B 13/10     .     Arrangements for feeding, heating, or supporting materials; Regulating movement, tension, or position of materials ([heating processes F26B 3/00](#))
- F26B 13/101    ..     {Supporting materials without tension, e.g. on or between foraminous belts}
- F26B 13/102    ...     {the materials, e.g. web, being supported in loops by rods or poles, which may be moving transversely, e.g. festoon dryers}
- F26B 13/103    ...     {with mechanical supporting means, e.g. belts, rollers, and fluid impingement}

- arrangement having a displacing effect on the materials}
- F26B 13/104 ... {supported by fluid jets only; Fluid blowing arrangements for flotation dryers, e.g. coanda nozzles}
- F26B 13/105 .. {Drying webs by contact with heated surfaces other than rollers or drums}
- F26B 13/106 ... {by moving them through a fluidised bed of heated particles}
- F26B 13/107 .. {Arrangements for guiding the feed end or trailing end of the materials, e.g. threading of webs}
- F26B 13/108 .. {using one or more blowing devices, e.g. nozzle bar, the effective area of which is adjustable to the width of the material}
- F26B 13/12 .. Regulating movement, tension, or position of materials
- F26B 13/14 .. Rollers, {drums, cylinders}{sorbent surfaces [F26B 13/26](#)}; {Arrangement of drives, supports, bearings, cleaning}
- F26B 13/145 ... {on the non-perforated outside surface of which the material is being dried by convection or radiation}
- F26B 13/16 ... perforated {in combination with hot air blowing or suction devices, e.g. sieve drum dryers}{[F26B 13/18](#) takes precedence}
- F26B 13/18 ... heated {or} cooled, {e.g. from inside, the material being dried on the outside surface by conduction}
- F26B 13/183 ..... {Arrangements for heating, cooling, condensate removal}
- F26B 13/186 ..... {using combustion}
- F26B 13/22 .. Arrangements of gas flames
- F26B 13/24 . Arrangements of devices using drying processes not involving heating (such processes per se [F26B 5/00](#))
- F26B 13/26 .. using sorbent surfaces, e.g. bands or coverings on rollers
- F26B 13/28 .. for applying pressure; for brushing; for wiping
- F26B 13/30 .. for applying suction {([F26B 13/16](#) takes precedence)}
- F26B 15/00**      **Machines or apparatus for drying objects with progressive movement; Machines or apparatus with progressive movement for drying batches of material in compact form ([F26B 13/00](#), [F26B 17/00](#) take precedence; conveyers in general B65G)**
- F26B 15/02 . with movement in the whole or part of a circle
- F26B 15/04 .. in a horizontal plane
- F26B 15/06 ... involving several planes, one above the other
- F26B 15/08 .. in a vertical plane
- F26B 15/085 ... {with endless clamp or tray conveyer, e.g. wicket conveyer}
- F26B 15/10 . with movement in a path composed of one or more straight lines, e.g. compound, {the movement being in alternate horizontal and vertical directions}
- F26B 15/105 .. {the articles, e.g. can lids, discs, being conveyed by means of rotating screw spindles}
- F26B 15/12 .. the lines being all horizontal or slightly inclined
- F26B 15/122 ... {the objects or batches of material being carried by transversely moving rollers or rods which may rotate}
- F26B 15/124 ..... {the objects being yarn hanks}
- F26B 15/126 ..... {the material being "pasta" products, e.g. spaghetti}

- F26B 15/128 . . . . [N. the rods being attached at one end to an endless conveying means, the other end being free to receive hollow articles, e.g. cans]
- F26B 15/14 . . . the objects or batches of materials being carried by trays or racks {or receptacles, which may be connected to endless chains or belts (trays, racks per se [F26B 25/18](#); with vertical movement [F26B 15/22](#))}
- F26B 15/143 . . . . {the receptacles being wholly or partly foraminous, e.g. containing a batch of loose material ([F26B 15/146](#), [F26B 15/205](#), [F26B 15/26](#) take precedence)}
- F26B 15/146 . . . . {applying multiple superimposed tray conveyers, the materials to be dried being dropped onto subsequent conveyer stretches, e.g. by allowing the trays to tilt at one point}
- F26B 15/16 . . . the objects or batches of materials being carried by wheeled trucks
- F26B 15/18 . . . the objects or batches of materials being carried by endless belts
- F26B 15/20 . . the lines being all vertical or steeply inclined
- F26B 15/205 . . . {the objects or batches of materials being carried by a vertical stack of foraminous trays or shelves either moving through a shaft or forming, with their edges, a moving shaft, the shaft being supplied with drying air}
- F26B 15/22 . . . the objects or batches of materials being carried by endless belts {the objects or batches of material being carried by trays or holders supported by endless belts or chains ([F26B 15/205](#) takes precedence; vertical bulk material conveyer-driers [F26B 17/06](#))}
- F26B 15/24 . . . . in a zig-zag path
- F26B 15/26 . with movement in a helical path
- F26B 17/00** **Machines or apparatus for drying materials in loose, plastic, or fluidised form, e.g. granules, staple fibres, with progressive movement** ([F26B 13/00](#) takes precedence; {feed or discharge arrangements [F26B 25/002](#)})
- F26B 17/001 . {the material moving down superimposed floors (superimposed belts [F26B 17/08](#))}
- F26B 17/002 . . {with floors which may rotate and turn over as a whole or in part, e.g. around a horizontal axis (superimposed tray conveyers [F26B 15/146](#))}
- F26B 17/003 . . {with fixed floors provided with scrapers ([F26B 17/006](#) and [F26B 17/007](#) take precedence)}
- F26B 17/005 . . {with rotating floors, e.g. around a vertical axis, which may have scrapers ([F26B 17/002](#), [F26B 17/006](#), [F26B 17/007](#) take precedence)}
- F26B 17/006 . . {the movement being imparted by oscillation or vibration}
- F26B 17/007 . . {having a sieve, e.g. classifying arrangement}
- F26B 17/008 . {the material being a slurry or paste applied onto moving elements, e.g. chains, plates, for drying thereon, and subsequently removed therefrom (the element being an endless web or belt-like conveyer [F26B 17/023](#); the element being a disc [F26B 17/282](#); the element being loose inert particles [F26B 3/205](#))}
- F26B 17/02 . with movement performed by belts carrying the materials; with movement performed by belts {or elements attached to endless belts or chains} propelling the materials over stationary surfaces {(the movement being in a helical path [F26B 15/26](#); [F26B 17/003](#), [F26B 17/263](#) take precedence)}
- F26B 17/023 . . {the material being a slurry or paste, which adheres to a moving belt-like endless conveyer for drying thereon, from which it may be removed in dried state, e.g. by scrapers, brushes or vibration}

- F26B 17/026 .. {the material being moved in-between belts which may be perforated}
- F26B 17/04 .. the belts being all horizontal or slightly inclined (F26B 17/08 takes precedence)
- F26B 17/045 ... {the material on the belt being agitated, dispersed or turned over by mechanical means, e.g. by vibrating the belt, by fixed, rotating or oscillating elements}
- F26B 17/06 .. the belts being all vertical or steeply inclined (F26B 17/08 takes precedence; {for materials in discrete batches F26B 15/22})
- F26B 17/08 .. the belts being arranged in a sinuous or zig-zag path {(F26B 17/026 takes precedence; superimposed tray conveyers F26B 15/146)}
- F26B 17/10 . with movement performed by fluid currents, e.g. issuing from a nozzle, {e.g. pneumatic, flash, vortex or entrainment dryers}(F26B 3/08 takes precedence)
- F26B 17/101 .. {the drying enclosure having the shape of one or a plurality of shafts or ducts, e.g. with substantially straight and vertical axis (F26B 17/107 takes precedence)}
- F26B 17/102 ... {with material recirculation, classifying or desintegrating means (F26B 17/103 takes precedence)}
- F26B 17/103 ... {with specific material feeding arrangements, e.g. combined with desintegrating means}
- F26B 17/104 ... {with fixed or moving internal bodies for defining or changing the course of the entrained material}
- F26B 17/105 ... {the shaft or duct, e.g. its axis, being other than straight, i.e. curved, zig-zag, closed-loop, spiral}
- F26B 17/106 .. {the drying enclosure, e.g. its axis, being substantially straight and horizontal, e.g. pneumatic drum dryers; the drying enclosure consisting of multiple substantially straight and horizontal stretches (F26B 17/107 takes precedence)}
- F26B 17/107 .. {pneumatically inducing within the drying enclosure a curved flow path, e.g. circular, spiral, helical; Cyclone or Vortex dryers (swirl or curved flow path induced mechanically, i.e. by rotating element F26B 3/0923)}
- F26B 17/108 .. {using impinging streams of entrained material}
- F26B 17/12 . with movement performed solely by gravity, {i.e. the material moving through a substantially vertical drying enclosure, e.g. shaft}
- F26B 17/122 .. {the material moving through a cross-flow of drying gas; the drying enclosure, e.g. shaft, consisting of substantially vertical, perforated walls}
- F26B 17/124 ... {the vertical walls having the shape of at least two concentric cylinders with the material to be dried moving in-between}
- F26B 17/126 ... {the vertical walls consisting of baffles, e.g. in louvre-arrangement}
- F26B 17/128 .. {with provisions for working under reduced or increased pressure, with or without heating}
- F26B 17/14 .. the materials moving through a counter-current of gas
- F26B 17/1408 ... {the gas being supplied and optionally extracted through ducts extending into the moving stack of material (in combination with fluid-heated closed tubes or other heating elements in contact with the stack of material F26B 17/16)}
- F26B 17/1416 .... {the ducts being half open or perforated and arranged horizontally}
- F26B 17/1425 .... {the ducts being perforated and arranged vertically}
- F26B 17/1433 ... {the drying enclosure, e.g. shaft, having internal members or bodies for guiding, mixing or agitating the material, e.g. imposing a zig-zag movement onto the material (F26B 17/1408, F26B 17/16 take precedence)}
- F26B 17/1441 .... {the members or bodies being stationary, e.g. fixed panels, baffles, grids, the position of which may be adjustable}

- F26B 17/145 . . . . . {consisting of non-perforated panels or baffles}
- F26B 17/1458 . . . . . {consisting of perforated panels or baffles; consisting of grids}
- F26B 17/1466 . . . . . {the members or bodies being in movement}
- F26B 17/1475 . . . . . {the movement being a vibration or oscillation ([F26B 17/26](#) takes precedence)}
- F26B 17/1483 . . . . . {the movement being a rotation around a vertical axis}
- F26B 17/1491 . . . . . {the movement being a rotation around a horizontal axis}
- F26B 17/16 . . . . . the materials passing down a heated surface, {e.g. fluid-heated closed ducts or other heating elements in contact with the moving stack of material ([F26B 17/128](#) takes precedence)}
- F26B 17/18 . . . . . with movement performed by rotating helical blades or other rotary conveyers {which may be heated} moving materials in stationary chambers, {e.g. troughs}
- F26B 17/20 . . . . . the axis of rotation being horizontal or slightly inclined
- F26B 17/205 . . . . . {with multiple chambers, e.g. troughs, in superimposed arrangement}
- F26B 17/22 . . . . . the axis of rotation being vertical or steeply inclined ({[F26B 17/003](#) takes precedence})
- F26B 17/24 . . . . . with movement performed by shooting or throwing the materials, {e.g. after which the materials are subject to impact ([F26B 17/108](#) takes precedence)}
- F26B 17/26 . . . . . with movement performed by reciprocating or oscillating conveyers propelling materials over stationary surfaces; with movement performed by reciprocating or oscillating shelves, sieves, or trays ({[F26B 17/006](#) takes precedence)}
- F26B 17/263 . . . . . {the conveying element making a rotary working movement while being transversely moved in one direction, the reverse or return movement being effected in an inoperative state, e.g. lifted, in rest}.
- F26B 17/266 . . . . . {the materials to be dried being moved in a helical, spiral or circular path, e.g. vibrated helix}
- F26B 17/28 . . . . . with movement performed by rollers or discs with material passing over or between them, e.g. suction drum, sieve, {the axis of rotation being in fixed position (moving rotating rollers [F26B 15/122](#))}
- F26B 17/282 . . . . . {the materials adhering to, and being dried on, the surface of rotating discs with or without scraping devices}
- F26B 17/284 . . . . . {the materials being dried on the non-perforated surface of heated rollers or drums (arrangements for heating or cooling drums, for removal of condensate [F26B 13/183](#))}
- F26B 17/286 . . . . . {Arrangements for application of materials to be dried onto the drums or rollers; Arrangements for removing dried materials from the drums or rollers, e.g. doctor blades}
- F26B 17/288 . . . . . {the materials being dried on perforated drums or rollers, e.g. sieve or suction drums}
- F26B 17/30 . . . . . with movement performed by rotary or oscillating containers; with movement performed by rotary floors ({the material moving down superimposed floors [F26B 17/001](#))}
- F26B 17/32 . . . . . the movement being in a horizontal or slightly inclined plane
- F26B 17/34 . . . . . the movement being in a vertical or steeply inclined plane

**F26B 19/00**                    **Machines or apparatus for drying solid materials or objects not covered by groups [F26B 9/00](#) to [F26B 17/00](#)**

- F26B 19/005                    . {Self-contained mobile devices, e.g. for agricultural produce (movable devices with radiation means [F26B 3/28](#); small self-contained devices for drying objects at rest [F26B 9/003](#))}

**F26B 20/00**                    **Combinations of machines or apparatus covered by two or more of groups [F26B 9/00](#) to [F26B 19/00](#)**

**Details of general application**

**F26B 21/00**                    **Arrangements {or duct systems, e.g. in combination with pallet boxes,} for supplying and controlling air or gases for drying solid materials or objects ({[F26B 9/10](#) takes precedence; systems for vehicle body drying [B60S 3/002](#)}; air conditioning or ventilation in general [F24F](#))**

- F26B 21/001                    . {Drying-air generating units, e.g. movable, independent of drying enclosure}
- F26B 21/002                    .. {heating the drying air indirectly, i.e. using a heat exchanger ([F26B 23/001](#) takes precedence; closed-loop systems [F26B 23/10](#))}
- F26B 21/003                    . {Supply-air or gas filters}
- F26B 21/004                    . {Nozzle assemblies; Air knives; Air distributors; Blow boxes ([F26B 3/082](#), [F26B 13/104](#), [F26B 13/108](#), [F26B 21/006](#) take precedence)}
- F26B 21/005                    . {Drying-steam generating means}
- F26B 21/006                    . {the gas supply or exhaust being effected through hollow spaces or cores in the materials or objects, e.g. tubes, pipes, bottles ([F26B 9/003](#) and [F26B 9/103](#) take precedence)}
- F26B 21/007                    .. {the objects being bobbin- or spool-like bodies}
- F26B 21/008                    .. {the objects being flexible articles, which may be blown up by the drying gas, e.g. tubes, sausage casings (fire hoses [A62C 33/02](#))}
- F26B 21/02                    . Circulating air or gases in closed cycles, e.g. wholly within the drying enclosure ([F26B 21/08](#), [F26B 21/14](#), {[F26B 23/022](#)} take precedence)
- F26B 21/022                    .. {with provisions for changing the drying gas flow pattern, e.g. by reversing gas flow, by moving the materials or objects through subsequent compartments, at least two of which have a different direction of gas flow (varying fan speed [F26B 21/12](#))}
- F26B 21/024                    ... {by using movable fan units}
- F26B 21/026                    ... {by reversing fan rotation}
- F26B 21/028                    ... {by air valves, movable baffles or nozzle arrangements}
- F26B 21/04                    .. partly outside the drying enclosure ({[F26B 21/006](#) takes precedence})
- F26B 21/06                    . Controlling, e.g. regulating, parameters of gas supply ([F26B 21/14](#) takes precedence; control in general [G05](#))
- F26B 21/08                    .. Humidity

- F26B 21/083 . . . {by using sorbent or hygroscopic materials, e.g. chemical substances, molecular sieves}
- F26B 21/086 . . . {by condensing the moisture in the drying medium, which may be recycled, e.g. using a heat pump cycle}
- F26B 21/10 . . . Temperature; Pressure {(F26B 23/026 takes precedence)}
- F26B 21/12 . . . Velocity of flow; Quantity of flow, {e.g. by varying fan speed, by modifying cross flow area (F26B 21/004 takes precedence; changing air flow pattern F26B 21/022)}
- F26B 21/14 . . . using gases or vapours other than air or steam, {e.g. inert gases}
- F26B 21/145 . . . {Condensing the vapour onto the surface of the materials to be dried (using condensing steam F26B 3/00; using chemical liquids F26B 5/005)}

**F26B 23/00 Heating arrangements** ({by radiation, e.g. infra-red, ultra-violet, solar F26B 3/28 and F26B 3/30}; using heated air or gases F26B 21/00)

- F26B 23/001 . . . {using waste heat}
- F26B 23/002 . . . {recovered from dryer exhaust gases (F26B 23/022 takes precedence)}
- F26B 23/004 . . . {by compressing and condensing vapour in exhaust gases, i.e. using an open cycle heat pump system}
- F26B 23/005 . . . {using a closed cycle heat pump system (with recycling of drying medium F26B 21/086); using a heat pipe system}
- F26B 23/007 . . . {recovered from the dried product (burning the product F26B 23/028)}
- F26B 23/008 . . . {using a heat pump cycle}
- F26B 23/02 . . . using combustion heating ({F26B 3/305, F26B 13/186, F26B 21/001,}F26B 23/10 take precedence)
- F26B 23/022 . . . {incinerating volatiles in the dryer exhaust gases, the produced hot gases being wholly, partly or not recycled into the drying enclosure}
- F26B 23/024 . . . {by means of catalytic oxidation}
- F26B 23/026 . . . {with pulse combustion, e.g. pulse jet combustion drying of particulate materials}
- F26B 23/028 . . . {using solid fuel; burning the dried product}
- F26B 23/04 . . . using electric heating (F26B 23/10 takes precedence)
- F26B 23/06 . . . resistance heating
- F26B 23/10 . . . using tubes or passages containing heated fluids, {e.g. acting as radiative elements; Closed-loop systems (for combustion gases F26B 3/305)}

**F26B 25/00 Details of general application not covered by group F26B 21/00 or F26B 23/00**(loading, conveying, and unloading in general B65G)

- F26B 25/001 . . . {Handling, e.g. loading or unloading arrangements}
- F26B 25/002 . . . {for bulk goods (F26B 17/103 takes precedence)}
- F26B 25/003 . . . {for articles}
- F26B 25/004 . . . {in the shape of discrete sheets (wicket conveyers F26B 15/085)}
- F26B 25/005 . . . {Treatment of dryer exhaust gases (incineration of volatiles F26B 23/022)}

- F26B 25/006 . . {Separating volatiles, e.g. recovering solvents from dryer exhaust gases}
- F26B 25/007 . . {Dust filtering; Exhaust dust filters}
- F26B 25/008 . {Seals, locks, e.g. gas barriers or air curtains, for drying enclosures ([F26B 11/024](#) and [F26B 13/005](#) take precedence)}
- F26B 25/009 . {Alarm systems; Safety systems, e.g. preventing fire and explosions (using inert gases [F26B 21/14](#))}
- F26B 25/02 . Applications of driving mechanisms, not covered by another subclass
- F26B 25/04 . Agitating, stirring, or scraping devices {(Arrangement of doctor blades [F26B 17/286](#))}
- F26B 25/06 . Chambers, containers, or receptacles {(large containers having means for heating, cooling, aerating or other conditioning of contents [B65D 88/74](#))}
- F26B 25/063 . . {Movable containers or receptacles, e.g. carts, trolleys, pallet-boxes (for use in freeze-drying apparatus [F26B 5/06](#); in general [B62D](#))}
- F26B 25/066 . . {Movable chambers, e.g. collapsible, demountable (self-contained mobile devices, e.g. for agricultural produce [F26B 19/005](#))}
- F26B 25/08 . . Parts thereof
- F26B 25/10 . . . Floors, roofs, or bottoms; False bottoms
- F26B 25/12 . . . Walls or sides; Doors
- F26B 25/14 . . Chambers, containers, receptacles of simple construction
- F26B 25/16 . . . mainly closed, e.g. drum
- F26B 25/18 . . . mainly open, e.g. dish, tray, pan, {rack (for drying agricultural produce [A01F 25/12](#))}
- F26B 25/185 . . . . {Spacers; Elements for supporting the goods to be dried, i.e. positioned in-between the goods to build a ventilated stack (separators for articles packaged in stacks [B65D 57/00](#); manipulating spacers for stacking purposes [B65G 57/005](#))}
- F26B 25/20 . Rollers ([F26B 25/06](#), [F26B 13/14](#) take precedence)
- F26B 25/22 . Controlling the drying process in dependence on liquid content of solid materials or objects
- F26B 25/225 . . {by repeated or continuous weighing of the material or a sample thereof}
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- F26B 2015/00** **Machines or apparatus for drying objects with progressive movement; Machines or apparatus with progressive movement for drying batches of material in compact form ([F26B 13/00](#), [F26B 17/00](#) take precedence; conveyers in general [B65G](#))**
- F26B 2015/003 . the load carrying elements having provisions for defining drying gas ducts, e.g. panels
- F26B 2015/006 . the drying tunnel not being partitioned by load carrying elements

**F26B 2200/00**      **Drying processes and machines for solid materials characterised by the specific requirements of the drying good**

- F26B 2200/02      . Biomass, e.g. waste vegetative matter, straw
- F26B 2200/04      . Garbage
- F26B 2200/06      . Grains, e.g. cereals, wheat, rice, corn
- F26B 2200/08      . Granular materials
- F26B 2200/10      . Grass
- F26B 2200/12      . Manure
- F26B 2200/14      . Sand
- F26B 2200/16      . Sea weed; Marine products
- F26B 2200/18      . Sludges, e.g. sewage, waste, industrial processes, cooling towers
- F26B 2200/20      . Teas, i.e. drying, conditioning, withering of tea leaves
- F26B 2200/22      . Tobacco leaves
- F26B 2200/24      . Wood particles, e.g. shavings, cuttings, saw dust

**Drying processes and machines for solid materials or objects characterised by the specific requirements of the drying good****F26B 2210/00**      **Drying processes and machines for solid objects characterised by the specific requirements of the drying good**

- F26B 2210/02      . Ceramic articles or ceramic semi-finished articles
- F26B 2210/04      . Eggs
- F26B 2210/06      . Long pasta, e.g. spaghetti
- F26B 2210/08      . Short pasta, e.g. macaroni, vermicelli
- F26B 2210/10      . Umbrellas
- F26B 2210/12      . Vehicle bodies, e.g. after being painted
- F26B 2210/14      . Veneer, i.e. wood in thin sheets
- F26B 2210/16      . Wood, e.g. lumber, timber